

REMARKS

Claims 9-12 and 24 are presently pending in the application. Reconsideration and allowance of all claims are respectfully requested in view of the following remarks.

The Examiner has rejected Claims 9, 11-12, and 24 under 35 U.S.C. §102(b) as being anticipated by Zhou. The Examiner has rejected Claim 10 under 35 U.S.C. §103 as being unpatentable over Zhou in view of Hatano et al. For the following reasons, the prior art rejections are respectfully traversed.

The Applicants respectfully submit that Zhou does not teach or suggest a semiconductor device including a single-crystal substrate made of a material different from nitride III-V compound semiconductors, and a device formed on one major surface of the single-crystal substrate by using III-V compound semiconductors, wherein electrical connection to the device is made through a via hole formed in the single-crystal substrate, as recited in amended Claim 9. Further, the Applicants respectfully submit that, in addition, Zhou does not teach or suggest the electrical connection to the device being made directly through a via hole formed in the substrate, as recited in Claim 24.

Rather, contrary to the Examiner's assertion, Zhou disclose only a III-V type compound semiconductor having a III-V substrate 21 (i.e., GaAs), not a substrate which is different in material from that of the III-V group compound semiconductors.

Further, Zhou is silent with respect to the use of a single crystal substrate, and the use of a via hole for electrical connection to the semiconductor device.

If Zhou does not teach or suggest all of the claim limitations of Claims 9 and 24, then Zhou cannot anticipate Claims 9 and 24 of the present invention, nor can the present invention be obvious over Zhou, and the rejection of Claims 9 and 24 under 35 U.S.C. §102(b) should be withdrawn.

Further, since Claims 10-12 depend from Claim 9, they are also patentably distinguishable over Zhou for the reasons cited above with respect to Claim 9.

With respect to Claim 10, the Applicants respectfully submit that neither the individual nor the combination of the Zhou and Hatano et al. references teaches or suggests a semiconductor device including a single-crystal substrate made of a material different from nitride III-V compound

semiconductors, and a device formed on one major surface of the single-crystal substrate by using III-V compound semiconductors, wherein electrical connection to the device is made through a via hole formed in the single-crystal substrate, as recited in amended Claim 9, nor the electrical connection to the device being made directly through a via hole formed in the substrate, as recited in Claim 24.

Rather, as stated above, Zhou is silent with respect to the use of a single crystal substrate or a via hole being used for electrical connection

Further, although the Examiner relies on Hatano et al. for the use of a substrate which is made from a material different from that of nitride III-V compound semiconductors, Hatano et al. provides no motivation for using such a substrate in Zhou. In fact, the use of a sapphire substrate 10 is merely mentioned in Hatano et al., without any disclosure or teaching as to its advantages.

Additionally, Zhou does not disclose or teach any advantages in making the substrate from a material different from GaAs. Further, in the state of the art, when nitride III-V compound semiconductors are used, the substrate material is usually from that group, such as GaN, or GaAs, etc., as in Zhou.

However, as stated in the Background of the Invention section of the present specification, single crystal (i.e., sapphire) substrates present problems in manufacturing when used with a nitride III-V compound semiconductor device. Hatano et al. do not refer to this problem and do not provide any solution.

Accordingly, the combination of the Zhou and Hatano et al. references fails to teach or suggest that III-V group compound semiconductors are used with a substrate that is a single crystal and different in material from that of the III-V group compound semiconductors, and that there would be a reasonable expectation of success to do so; thus, providing no motivation to combine Zhou and Hatano et al. to reach the claimed features of the present invention. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

However, in the present invention, the use of a single crystal material for a substrate which is different from the nitride III-V compound semiconductor, and with electrical connection being performed


through the via hole, is nonobvious since the single crystal material must be manufactured by a special process in order to be appropriately thinned for use with a nitride III-V compound semiconductor. Further, the resulting enhanced properties of the semiconductor device when the claimed materials are used, possess unexpectedly advantageous and superior properties, such as reduced operation voltage etc.

Accordingly, Claim 24 is not obvious over either the individual or the combination of the Zhou and Hatano et al. references, and the rejection of Claim 24 under 35 U.S.C. §103 should be withdrawn.

If the Examiner believes that there is any issue which could be resolved by a telephone or personal interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such an extension is to be charged to Deposit Account No. 19-3140.

Respectfully submitted,


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